Monomoy Lens Focus on: HARWICH Groundwater Protection

Prepared by the

Water Resources Office
Cape Cod Commission
for the Harwich Water Department

This map shows the Monomoy Lens water table in 10 foot contour intervals.

January 1998

What's this pamphlet all about?

Cape Cod is fortunate to have an abundant supply of high quality drinking water. This brochure answers frequently asked questions about groundwater and discusses potential impacts from population growth on drinking water supplies. The information in this brochure is intended to familiarize residents of the town of Harwich with local drinking water supply sources and what is being done to ensure they will remain safe for years to come.

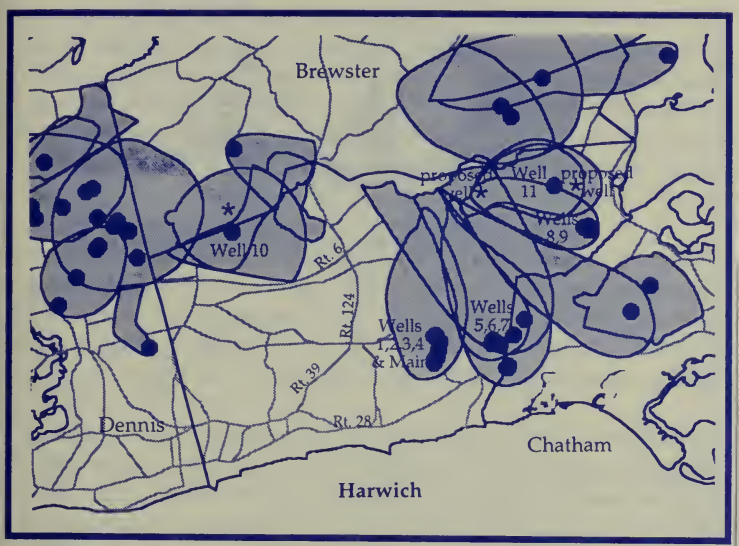
Where does the water supply originate?

The Monomoy Lens is the source of fresh water for the town of Harwich. This lens is one of the six groundwater lenses that make up the Cape Cod Sole Source Aquifer. Lenses can be thought of as mounds of groundwater bordered by marine water at the edge, bedrock on the bottom, and separated from each other by tidal waters, such as the Bass River, that cut across the Cape peninsula. Groundwater refers to subsurface water in soils and geologic formations that are fully saturated.

Groundwater in the Monomoy Lens is replenished from rain or snow that seeps into the ground. The water percolates through the soil to reach the water table which is the surface of the groundwater lens. Water within the lens slowly moves toward the coast where it discharges into the ocean. Along the way, groundwater flows into the numerous kettlehole lakes and ponds, and into streams feeding marine embayments along the coast.

The map on the next page shows the location of the Harwich public drinking water supplies. The shaded areas represent the land area where the groundwater flows toward the well instead of moving all the way to the shore. These areas are referred to as recharge areas, wellhead protection areas, or, if state approved, Zone II's. Recharge areas for wells located in Dennis, Brewster, and Chatham that cross the Harwich town boundaries are also shown.

Harwich Public Supply Wells



Wellhead Protection Area

Public Supply Well

Future Supply Well Site

How much water does Harwich use?

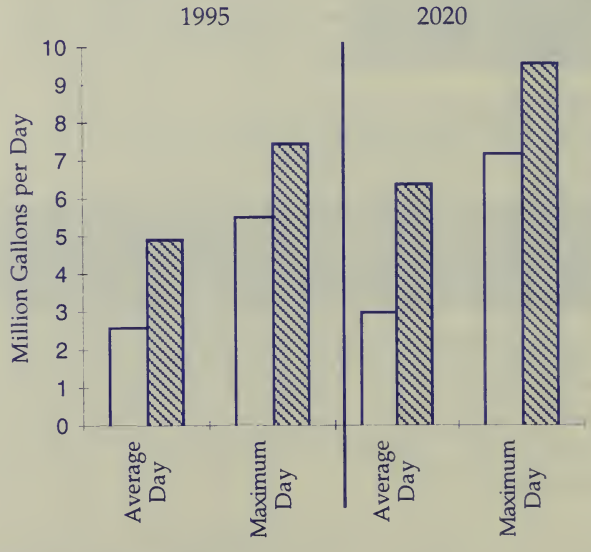
In 1996, the Harwich Water Department had twelve wells in operation that pumped an average of 1,523,240 gallons per day providing water to 12,000 people year round and 2,932,421 gallons per day to 36,000 people during the summer months.

Public water services include over 168 miles of main, 8186 residential hook-ups, and 339 commercial/municipal hook-ups. An estimated 300 homes or businesses are supplied by private wells.

Is there enough water to supply the town in the future?

The Harwich water department is always in the process of planning for future water supplies to meet its growing needs and to ensure an adequate supply in the event of an emergency well closure. Currently, Harwich has plans for two additional well sites which could provide an additional 1.5 million gallons/day. The following chart compares water demand and supply for existing and future conditions. The chart shows that based on current population predictions Harwich can provide enough water to its residents for the next twenty-five years. Additional supplies may be needed if there is a big shift from seasonal to year round residents or if maximum day demand conditions continue for more than a few days. As iron and manganese levels increase at various sites, treatment may be necessary to improve overall quality and ensure continuance of an adequate supply.

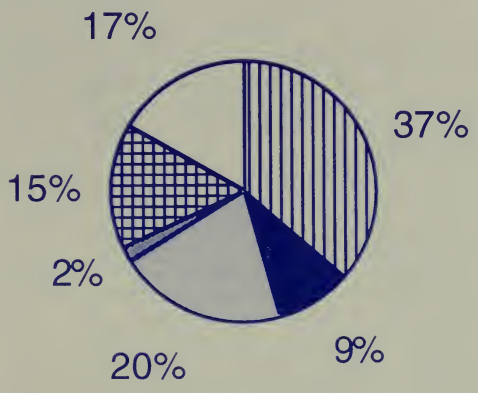
Harwich Public Water Supply and Demand



Demand
(for planning purposes demand includes loss of largest supply)

Supply
Average day - wells pumping 16 hours
Maximum day - wells pumping 24 hours
(Maximum pumping can only be sustained for a short time.)

Harwich Land Use Percentages



Source: 1993 Assessor's data

Residential	Commercial developable
Commercial/Industrial/ Agricultural	Undevelopable
Residential developable	Open space/Conservation

How can land use impact water supplies?

The chart above shows the distribution of land use in the town. Open space, which comprises 17 percent of the total land area in Harwich, is beneficial to protect public water supplies from potential contamination sources. The town is currently 37 percent residential and 9 percent commercially developed. One of the greatest threats to water supplies is non-point source pollution from septic systems. Zoning bylaws protect these supplies by setting appropriate setbacks from supply wells and limiting septic system density in areas contributing to water supplies. Water supplies may also be threatened from improper use and disposal of chemical products used in homes or businesses. Steps to educate residents and businesses on proper disposal of these materials is the best defense from pollution. Each year, the third Saturday in June, the town holds a household hazardous waste collection to help minimize improper disposal of these materials. Recycling facilities are available at the landfill for batteries, motor oil and filters, antifreeze, and paint.

Groundwater Protection Regulations

	REGULATED BY:		
WATER SUPPLY	**STATE**	**COUNTY**	**TOWN OF HARWICH**
Drinking Water Protection District	310 CMR 22.21(2)	RPP	Zoning
Private Well			Board of Health

WASTEWATER/NUTRIENTS

Individual Sewage Disposal Systems	310 CMR 15:00	DRI review	Board of Health
Wastewater Treatment Plants	310 CMR 5.00	DRI review	Zoning/Board of Health
Nutrient Loading	310 CMR 22.21/15:00	RPP/DRI review	Zoning
Animal Manures			Zoning

HAZARDOUS MATERIALS

Toxic and Hazardous Materials	310 CMR 22.21	RPP	Zoning
Floor Drains	310 CMR 22.21		Board of Health
Underground Storage Tanks	527 CMR 9.00		Board of Health
Herbicides/Pesticides	333 CMR		Board of Health

CMR: Code of Massachusetts Regulation
Not regulated

RPP: Regional Policy Plan (Cape Cod Commission)
DRI: Development of Regional Impact

What actions have been taken to protect water supplies?

The table shown above lists the water resource protection controls relating to wastewater and hazardous materials that are enforced at the local, county and state levels. Harwich has many good regulations in place and is in full compliance with state drinking water requirements. Wellhead protection is extended to the surrounding towns of Dennis, Brewster, and Chatham where Zone II's cross into Harwich.

Additionally, groundwater is protected by a variety of Board of Health regulations relating to private wells, commercial floor drains, underground storage tanks, herbicides/pesticides, and on-site septic systems.

What else can be done to safeguard future supplies?

There are several actions that can be taken to strengthen water supply protection efforts in the town. The Board of Health could adopt a townwide hazardous material regulation which includes site inspection, registration, and inventory.

In order to reduce the nitrogen load from septic systems, minimum residential zoning could be increased in zones of contribution to public supply wells. The town should continue to purchase potentially developable residential land located within existing wellhead protection areas and for use as future well sites.

How can I be sure that the water is safe to drink?

Harwich's public water supply is tested at least twice each month for bacteria, and annually for nitrate-nitrogen and other organic and inorganic compounds specified by state and federal standards. If any problems are encountered, law requires public notice to be published in a local paper and the problem corrected. Certified water operators are always available to provide customers with copies of recent water quality results or to answer specific questions.

The water supply is of excellent quality requiring treatment only to control the natural acidity and periodic chlorination when cleaning the tanks. Average nitrate-nitrogen concentration for the Harwich public supply wells is presently 0.73 parts per million which is well below the state and federal limit of 10 ppm.

Private well water quality is the responsibility of individual property owners and should be tested regularly. Private wells may experience aesthetic problems such as staining and odor from high concentrations of iron or manganese. High levels of sodium, from salt water or road salt, are occasionally detected. Wells testing high in bacteria or nitrate-nitrogen may indicate too much fertilizer is being used or a septic system is too close to the well. High levels of nitrate should be monitored, especially if pregnant women or infants are using the supply.

Water testing services are available at the Barnstable County Department of Health and the Environment Water Lab, located in the Superior Court Building on Route 6A in Barnstable Village. The charge for a routine analysis is $25 per sample and $75 for a volatile organic compound analysis. Sterilized containers must be used and are available at the lab and the health department.

For additional information on water supplies:

- Harwich Water Department (508)432-0304
- Harwich Health Department (508)430-7509
- Cape Cod Commission (508)362-3828
- Cape Cod Cooperative Extension (508)362-2511
- Barnstable County Dept. of Health and the Environment (508)362-2511
- Dept. of Environmental Protection, Southeast Regional Office (508)946-2760

Cape Cod Commission
E-mail: water@cape.com
World Wide Web: http://www.capecodcommission.org